Program Endorsement

Program Manager Transportation, MARCOR (Sept. 13, 2000)

UNITED STATES MARINE CORPS
PROGRAM MANAGER TRANSPORTATION (CODE: CSLE:TRANS)
MARINE CORPS SYSTEMS COMMAND
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13 Sep 00

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Subj: SUPPORT FOR ULTRASHORT PULSE LASER BEAM SURVEY MANUFACTURING TECHNOLOGY PROGRAM

1. Ultrashort pulse or femtosecond laser materials processing is an emerging technology which can provide unique machining capabilities and produce substantial return on investment in the manufacture of components relevant to both Navy and Marine Corps systems, particularly the diesel powered vehicles such as the MTVR and the HMMWVA2. The Ultrashort Pulse Laser Beam Survey Project, MANTECH Project A0957, is presently sponsored by the Office of Naval Research and is confirming the usefulness of this technology in manufacturing.

2. The pending revisions to the vehicle emissions standards impose severe limits on the emissions of diesel engines. To comply with such emission limits, manufacturers have been optimizing their engine designs in terms of configuration, fuel injector characteristics, fuel formulation and emissions capture system. Optimization of all these factors is necessary. One is the need to produce smaller fuel spray droplets for improved combustion. The only viable technique to produce fuel injector orifice sizes smaller than 100μm is by laser drilling. The femtosecond laser is anticipated to offer an advantage in drilling these holes rapidly and efficiently and also in addressing the back wall damage problem when the laser beam penetrates the fuel injector wall and interacts with the back wall. Industrial implementers include Clark-MXR, Lambda Physik, Caterpillar and ExtrudeHone.

3. This command endorses this project and will support ultrashort pulse laser drilling of holes in diesel engine fuel injectors provided the goals of this program to reduce total ownership cost are met.

Semper Fi,

T. F. MANLEY II
LtCol, USMC

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